# Quadratics: Objects in Motion

The function rule relating height *h* as a function of time *t* can be written as:

feet $\rightarrow h = h_i + v_i t - 16t^2$

$h$ = height above the ground

$h_i$ = initial height when time = 0 secs

$v_i$ = initial upward velocity

16 = pull of gravity in $ft/sec^2$

* Use this rule when talking about meters.

$h_f = h_i + v_i t - 4.9t^2$

4.9 = pull of gravity in $meters/sec^2$

Ex: A diver will dive off a 10 ft high springboard with an initial upward velocity of 25 feet per second.

(a) Write a rule so h is a function of t.

rule: $h = 10 + 25t - 16t^2$

(b) When will the diver hit the water? Write an equation to represent this situation.

* When the diver hits the water the height $h = 0$ ft.

$$0 = 10 + 25t - 16t^2$$